

NISHIOKA
Appl. No. To Be Assigned
April 22, 2004

AMENDMENTS TO THE CLAIMS:

Please cancel claims 1-20 without prejudice or disclaimer.

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-20. (Canceled)

21. (New) A maintenance mechanism for a print head having a nozzle surface in which are formed a plurality of nozzles, comprising:

a head cap, reciprocally movable between a capping position for covering the nozzles and a retracted position separated from the nozzle surface;

a pump, connected to the head cap;

a drive source;

a transmission member, rotated by the drive source to drive the pump;

a cam, reciprocally rotatable between a first position and a second position to reciprocally move the head cap; and

a clutch, which rotates the cam together with the transmission member, but rotates only the transmission member when the cam reaches each one of the first position and the second position.

22. (New) The maintenance mechanism as set forth in claim 21, wherein:

a cam groove is formed on an outer peripheral surface of the cam in a predetermined circumferential angular range; and

the maintenance mechanism further comprises a cap driving pin slidably movable along the cam groove to reciprocally move the head cap.

23. (New) The maintenance mechanism as set forth in claim 21, wherein:
a first engagement member and a second engagement member are provided with the cam, and a third engagement member is disposed at a predetermined position; and
a rotation of the cam in a first direction is stopped when the first engagement member engages with the third engagement member, and a rotation of the cam in a second direction is stopped when the second engagement member engages with the third engagement member.

24. (New) The maintenance mechanism as set forth in claim 22, wherein a rotation of the cam in a first direction is stopped when the cap driving pin reaches at a first dead end of the cam groove, and a rotation of the cam in a second direction is stopped when the cap driving pin reaches at a second dead end of the cam groove.

25. (New) The maintenance mechanism as set forth in claim 23, wherein the transmission member and the cam are coaxially arranged.

26. (New) The maintenance mechanism as set forth in claim 25, wherein the clutch includes an urging member which presses one circular end surface of the transmission member and one end surface of the cam together.

27. (New) The maintenance mechanism as set forth in claim 23, wherein the pump is a tube pump which performs a sucking operation only when the cam is rotated in either one of the first direction and the second direction.

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28. (New) The maintenance mechanism as set forth in claim 22, wherein the head cap includes:

a cap body having an opening which faces the nozzle surface;

a cap holder, which holds the cap body;

an urging member, disposed in the cap holder to urge the cap body in a direction that the cap body is projected from the cap holder; and

a vent valve, closed when the cap body of the head cap placed at the capping position is pushed toward the cap holder by a predetermined amount against an urging force of the urging member, so that an interior space of the head cap is isolated from atmosphere.

29. (New) The maintenance mechanism as set forth in claim 28, wherein the cam groove includes:

a first portion which moves the cap driving pin so as to place the cap holder at a first capping position where the cap body covers the nozzles and the vent valve is closed; and

a second portion which moves the cap driving pin so as to place the cap holder at a second capping position where the cap body covers the nozzles and the vent valve is opened.

30. (New) The maintenance mechanism as set forth in claim 29, wherein:

the cam groove includes a guide portion which guides the cap driving pin situated in the first portion to the second portion; and

wherein the cap driving pin situated in the vicinity of one end of the first portion is guided to the second portion via the guide portion, when the cap driving pin is moved away from the one end of the first portion.

31. (New) The maintenance mechanism as set forth in claim 30, wherein:
the first portion includes a depth-decreasing portion in which a depth thereof gradually decreases toward the one end thereof; and
the guide portion connects a part in the first portion in the vicinity of the depth-decreasing portion and the second portion.

32. (New) The maintenance mechanism as set forth in claim 22, wherein the cam groove is one continuous groove, and the predetermined circumferential angular range is 360 degrees or less.

33. (New) The maintenance mechanism as set forth in claim 21, further comprising an intermittent gear arranged coaxially with the cam, so as to rotate integrally with the cam,

wherein a driving force of the drive source is transmitted to the intermittent gear only in a predetermined circumferential angular range of the cam between the first position and the second position.

34. (New) The maintenance mechanism as set forth in claim 22, further comprising:

a wiper, reciprocally movable between a wiping position for wiping the nozzle surface and a standby position; and

a wiper driving pin, slidably moving along the cam groove to reciprocally move the wiper,

wherein the cam groove includes:

a first dead end portion, at which the wiper driving pin is placed when a rotation of the cam in a first direction is stopped;

a wiper driving portion, continued from the first dead end portion, which moves the wiper driving pin to reciprocally move the wiper;

a second dead end portion, at which the cap driving pin is placed when a rotation of the cam in a second direction is stopped; and

a cap driving portion, continued from the second dead end portion, which moves the cap driving pin to reciprocally move the head cap.

35. (New) The maintenance mechanism as set forth in claim 34, wherein the pump is a tube pump which performs a sucking operation only when the cam is rotated in the second direction.

36. (New) The maintenance mechanism as set forth in claim 27, wherein the pump is arranged coaxially with the cam.

37. (New) The maintenance mechanism as set forth in claim 35, wherein the pump is arranged coaxially with the cam.

38. (New) The maintenance mechanism as set forth in claim 22, further comprising an urging member which urges the cap driving pin toward a bottom surface of the cam groove.

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39. (New) The maintenance mechanism as set forth in claim 34, further comprising an intermittent gear arranged coaxially with the cam, so as to rotate integrally with the cam,

wherein a driving force of the drive source is transmitted to the intermittent gear only in a predetermined circumferential angular range of the cam between the first dead end portion and the second dead end portion of the cam groove.

40. (New) An ink jet printer comprising the maintenance mechanism as set forth in claim 21.